

PATENT COOPERATION TREATY

From the
INTERNATIONAL SEARCHING AUTHORITY

To:

see form PCT/ISA/220

PCT

WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY
(PCT Rule 43bis.1)

Date of mailing
(day/month/year) see form PCT/ISA/210 (second sheet)

Applicant's or agent's file reference
see form PCT/ISA/220

FOR FURTHER ACTION
See paragraph 2 below

International application No.
PCT/IB2005/050896

International filing date (day/month/year)
14.03.2005

Priority date (day/month/year)
16.03.2004

International Patent Classification (IPC) or both national classification and IPC
G06K9/00

Applicant
KONINKLIJKE PHILIPS ELECTRONICS, N.V.

1. This opinion contains indications relating to the following items:

- ☒ Box No. I Basis of the opinion
- ☐ Box No. II Priority
- ☐ Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- ☐ Box No. IV Lack of unity of invention
- ☒ Box No. V Reasoned statement under Rule 43bis.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
- ☐ Box No. VI Certain documents cited
- ☐ Box No. VII Certain defects in the international application
- ☒ Box No. VIII Certain observations on the international application

2. FURTHER ACTION

If a demand for international preliminary examination is made, this opinion will usually be considered to be a written opinion of the International Preliminary Examining Authority ("IPEA"). However, this does not apply where the applicant chooses an Authority other than this one to be the IPEA and the chosen IPEA has notified the International Bureau under Rule 66.1bis(b) that written opinions of this International Searching Authority will not be so considered.

If this opinion is, as provided above, considered to be a written opinion of the IPEA, the applicant is invited to submit to the IPEA a written reply together, where appropriate, with amendments, before the expiration of three months from the date of mailing of Form PCT/ISA/220 or before the expiration of 22 months from the priority date, whichever expires later.

For further options, see Form PCT/ISA/220.

3. For further details, see notes to Form PCT/ISA/220.

Name and mailing address of the ISA:



European Patent Office - P.B. 5818 Patentlaan 2
NL-2280 HV Rijswijk - Pays Bas
Tel. +31 70 340 - 2040 Tx: 31 851 epo nl
Fax: +31 70 340 - 3016

Authorized Officer

Neubüser, B

Telephone No. +31 70 340-4983



**WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY**

International application No.
PCT/IB2005/050896

Box No. I Basis of the opinion

1. With regard to the language, this opinion has been established on the basis of the international application in the language in which it was filed, unless otherwise indicated under this item.
 - ☐ This opinion has been established on the basis of a translation from the original language into the following language , which is the language of a translation furnished for the purposes of international search (under Rules 12.3 and 23.1(b)).
2. With regard to any nucleotide and/or amino acid sequence disclosed in the international application and necessary to the claimed invention, this opinion has been established on the basis of:
 - a. type of material:
 - ☐ a sequence listing
 - ☐ table(s) related to the sequence listing
 - b. format of material:
 - ☐ in written format
 - ☐ in computer readable form
 - c. time of filing/furnishing:
 - ☐ contained in the international application as filed.
 - ☐ filed together with the international application in computer readable form.
 - ☐ furnished subsequently to this Authority for the purposes of search.
3. ☐ In addition, in the case that more than one version or copy of a sequence listing and/or table relating thereto has been filed or furnished, the required statements that the information in the subsequent or additional copies is identical to that in the application as filed or does not go beyond the application as filed, as appropriate, were furnished.
4. Additional comments:

**WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY**International application No.
PCT/IB2005/050896**Box No. V Reasoned statement under Rule 43b/s.1(a)(i) with regard to novelty, inventive step or
industrial applicability; citations and explanations supporting such statement****1. Statement**

Novelty (N)	Yes: Claims	2,3,7,8,10,11
	No: Claims	1,4-6,9,12,13
Inventive step (IS)	Yes: Claims	
	No: Claims	1-13
Industrial applicability (IA)	Yes: Claims	1-13
	No: Claims	

2. Citations and explanations

see separate sheet

Box No. VIII Certain observations on the international application

The following observations on the clarity of the claims, description, and drawings or on the question whether the claims are fully supported by the description, are made:

see separate sheet

**WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING
AUTHORITY (SEPARATE SHEET)**

International application No.

PCT/IB2005/050896**Re Item V.**

- 1 Reference is made to the following document:

D₁ : BOVIK, AL (EDITOR); JAIN, ANIL K. (AUTHOR): "Handbook of Image and Video Processing, Section 10.5 Fingerprint Classification and Matching" 2000, ACADEMIC PRESS, SAN DIEGO, US 275840, XP002328913
ISBN: 0-12-119790-5

2 INDEPENDENT CLAIM 1

- 2.1 The present application does not meet the criteria of Article 33(1) PCT, because the subject-matter of claim 1 is not new in the sense of Article 33(2) PCT.
Document D₁ discloses (the references in parentheses applying to this document):

A fingerprint authentication method for a user fingerprint image based on a plurality of control fingerprint images (called templates in D₁)

(1 Introduction: "The problem of resolving the identity of a person can be categorized into two fundamentally distinct types of problems with different inherent complexities: verification and recognition. Verification (authentication) refers to the problem of confirming or denying a person's claimed identity (Am I who I claim I am? Recognition (Who am I) refers to the problem of establishing a subjects identity". Footnote¹: "Often, recognition is also referred to as identification"), comprising

- detecting at least one control point within the user fingerprint image and at least one control point within each control fingerprint

(11 Fingerprint matching, last par. on p. 831: "The registration essentially involves alignment base on rotation/translation and may optionally include scaling. The parameters of alignment are typically estimated either from (1) singular points in the fingerprint, e.g. core or delta locations; (2) pose clustering ...; or (3) any other landmark features.")

- superimposing the user fingerprint image with each control fingerprint image as a function of one or more control points within at least one of the user fingerprint images and one or more of the control fingerprint images (11 Fingerprint Matching, first par.: "Fingerprint matching has been approached from several different

**WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING
AUTHORITY (SEPARATE SHEET)**

International application No.

PCT/IB2005/050896

strategies, like image-based ...")

- authenticating a first control fingerprint image having a shortest superimposition distance as an identified fingerprint image

(11 Fingerprint Matching, second par. of right hand col.: "The matching phase typically defines the similarity (distance) metric between two fingerprint representations and determines whether a given pair of representations is captured from the same finger ... based on whether a quantified (dissimilarity) is greater(less) than a certain (predetermined) threshold.").

3 INDEPENDENT CLAIM 6

3.1 The present application does not meet the criteria of Article 33(1) PCT, because the subject-matter of claim 6 is not new in the sense of Article 33(2) PCT.

Claim 6 specifies a system which is analogous to the method defined in claim 1. Therefore the argumentation given in item 2.1 above applies.

4 INDEPENDENT CLAIM 9

4.1 The present application does not meet the criteria of Article 33(1) PCT, because the subject-matter of claim 9 is not new in the sense of Article 33(2) PCT.

Claim 9 specifies a system for fingerprint *identification*. The passages cited in item 2.1 disclose all features except for the database to store control fingerprints. This however disclosed in Fig. 2 or also the first par. of section 5 "System Architecture". Therefore, all features of claim 9 are known from D₁.

5 DEPENDENT CLAIMS 2-5, 7, 8, 10-13

Dependent claims 2-5, 7, 8, 10-13 do not contain any features which, in combination with the features of any claim to which they refer, meet the requirements of the PCT in respect of novelty and/or inventive step (Article 33(2) and (3) PCT).

5.1 The additional features of claims 2,3,7,8,10,11 are regarded as trivial. It is noted that the source of the fingerprint signal (such as pressure sensor, capacitive sensor, optical sensor) *does not* influence the processing of the signal, and it is further noted that the signals or a capacitive or optical sensor can be interpreted as signals representing pressures.

Thus, to specify that the signal originates from a pressure sensor is regarded as a juxtaposition with the other unrelated features of claim 2.

**WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING
AUTHORITY (SEPARATE SHEET)**

International application No.

PCT/IB2005/050896

That fingerprint images can be grayscale resp. black and white is very well known and e.g. discloses by D₁ (Fig. 1 resp. Fig. 4).

5.2 Claim 4 does not seem to introduce additional features. The passages cited in item 2.1 are therefore considered to disclose the subject matter of claim 4. It therefore seems that the subject matter of claim 4 is not new.

5.3 Claim 5 is not clear (Article 6 PCT): It is not clear whether the distance measure depends on the number of movement steps, and further how the sorting step (72) relates to the selection step (74). The seemingly corresponding passage of the description (p.7, line 24-25) is also not clear.

This objection notwithstanding, the subject matter of claim 5 does not seem to be new as it was understood from the description that it might relate to the last par. of the left hand column of p. 832 of D₁, namely to elastic string matching.

5.4 The argumentation of item 5.2 also applies mutatis mutandis to claim 12. It hence seems that the subject matter of claim 12 is not new.

5.5 The argumentation of item 5.3 also applies to claim 13. Hence, the subject matter of claim 13 does not seem to be new.

Re Item VIII.

- 1 The terms "control point" and "control fingerprint image" used through the whole application are not standard in the field of fingerprint recognition, and in particular leave the reader in doubt about the scope of the claims (Article 6 PCT).
- 2 In claims 1, 4, 6, 9, 12 it is not clear what is meant by moving the control points during the matching process (Article 6 PCT). It can also not be doubtlessly derived from the these claims (and also not from the description) if the alleged invention relates to image based or feature point based fingerprint recognition in the sense of D₁, first par. of section "11 Fingerprint Matching".
- 3 Passages like "... is dependent upon a commercial implementation of the present invention, and is therefore without limit." are not allowable according to the PCT Guidelines, 5.30.

PATENT COOPERATION TREATY

From the
INTERNATIONAL SEARCHING AUTHORITY

To:

see form PCT/ISA/220

PCT

WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY
(PCT Rule 43bis.1)Date of mailing
(day/month/year) see form PCT/ISA/210 (second sheet)Applicant's or agent's file reference
see form PCT/ISA/220FOR FURTHER ACTION
See paragraph 2 belowInternational application No.
PCT/B2005/050896International filing date (day/month/year)
14.03.2005Priority date (day/month/year)
16.03.2004International Patent Classification (IPC) or both national classification and IPC
G06K9/00Applicant
KONINKLIJKE PHILIPS ELECTRONICS, N.V.

1. This opinion contains indications relating to the following items:

- ☒ Box No. I Basis of the opinion
- ☐ Box No. II Priority
- ☐ Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- ☐ Box No. IV Lack of unity of invention
- ☒ Box No. V Reasoned statement under Rule 43bis.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
- ☐ Box No. VI Certain documents cited
- ☐ Box No. VII Certain defects in the international application
- ☒ Box No. VIII Certain observations on the international application

2. FURTHER ACTION

If a demand for international preliminary examination is made, this opinion will usually be considered to be a written opinion of the International Preliminary Examining Authority ("IPEA"). However, this does not apply where the applicant chooses an Authority other than this one to be the IPEA and the chosen IPEA has notified the International Bureau under Rule 86.1bis(b) that written opinions of this International Searching Authority will not be so considered.

If this opinion is, as provided above, considered to be a written opinion of the IPEA, the applicant is invited to submit to the IPEA a written reply together, where appropriate, with amendments, before the expiration of three months from the date of mailing of Form PCT/ISA/220 or before the expiration of 22 months from the priority date, whichever expires later.

For further options, see Form PCT/ISA/220.

3. For further details, see notes to Form PCT/ISA/220.

Name and mailing address of the ISA:



European Patent Office - P.B. 5818 Patentlaan 2
NL-2280 HV Rijswijk - Pays Bas
Tel. +31 70 340 - 2040 Tx: 31 851 epo nl
Fax: +31 70 340 - 3016

Authorized Officer

Neubüser, B.

Telephone No. +31 70 340-4983



**WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY**International application No.
PCT/IB2005/050896**Box No. I Basis of the opinion**

1. With regard to the **language**, this opinion has been established on the basis of the international application in the language in which it was filed, unless otherwise indicated under this item.
 - ☐ This opinion has been established on the basis of a translation from the original language into the following language , which is the language of a translation furnished for the purposes of international search (under Rules 12.3 and 23.1(b)).
2. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application and necessary to the claimed invention, this opinion has been established on the basis of:
 - a. type of material:
 - ☐ a sequence listing
 - ☐ table(s) related to the sequence listing
 - b. format of material:
 - ☐ in written format
 - ☐ in computer readable form
 - c. time of filing/furnishing:
 - ☐ contained in the international application as filed.
 - ☐ filed together with the international application in computer readable form.
 - ☐ furnished subsequently to this Authority for the purposes of search.
3. ☐ In addition, in the case that more than one version or copy of a sequence listing and/or table relating thereto has been filed or furnished, the required statements that the information in the subsequent or additional copies is identical to that in the application as filed or does not go beyond the application as filed, as appropriate, were furnished.
4. Additional comments:

**WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY**

International application No.
PCT/B2005/050896

**Box No. V Reasoned statement under Rule 43b/s.1(a)(I) with regard to novelty, inventive step or
industrial applicability; citations and explanations supporting such statement**

1. Statement

Novelty (N)	Yes: Claims	2,3,7,8,10,11
	No: Claims	1,4-6,9,12,13
Inventive step (IS)	Yes: Claims	
	No: Claims	1-13
Industrial applicability (IA)	Yes: Claims	1-13
	No: Claims	

2. Citations and explanations

see separate sheet

Box No. VIII Certain observations on the international application

The following observations on the clarity of the claims, description, and drawings or on the question whether the claims are fully supported by the description, are made:

see separate sheet

**WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING
AUTHORITY (SEPARATE SHEET)**

International application No.

PCT/IB2005/050896

Re Item V.

1 Reference is made to the following document:

D₁ : BOVIK, AL (EDITOR); JAIN, ANIL K. (AUTHOR): "Handbook of Image and Video Processing, Section 10.5 Fingerprint Classification and Matching" 2000, ACADEMIC PRESS, SAN DIEGO, US 275840, XP002328913
ISBN: 0-12-119790-5

2 INDEPENDENT CLAIM 1

2.1 The present application does not meet the criteria of Article 33(1) PCT, because the subject-matter of claim 1 is not new in the sense of Article 33(2) PCT.
Document D₁ discloses (the references in parentheses applying to this document):

A fingerprint authentication method for a user fingerprint image based on a plurality of control fingerprint images (called templates in D₁)

(1 Introduction: "The problem of resolving the identity of a person can be categorized into two fundamentally distinct types of problems with different inherent complexities: verification and recognition. Verification (authentication) refers to the problem of confirming or denying a person's claimed identity (Am I who I claim I am? Recognition (Who am I) refers to the problem of establishing a subjects identity¹." Footnote¹: "Often, recognition is also referred to as Identification"),
comprising

- detecting at least one control point within the user fingerprint image and at least one control point within each control fingerprint

(11 Fingerprint matching, last par. on p. 831: "The registration essentially involves alignment base on rotation/translation and may optionally include scaling. The parameters of alignment are typically estimated either from (1) singular points in the fingerprint, e.g. core or delta locations; (2) pose clustering ...; or (3) any other landmark features.")

- superimposing the user fingerprint image with each control fingerprint image as a function of one or more control points within at least one of the user fingerprint images and one or more of the control fingerprint images (11 Fingerprint Matching, first par.: "Fingerprint matching has been approached from several different

**WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING
AUTHORITY (SEPARATE SHEET)**

International application No.

PCT/IB2005/050896

strategies, like image-based ...")

- authenticating a first control fingerprint image having a shortest superimposition distance as an identified fingerprint image

(11 Fingerprint Matching, second par. of right hand col.: "The matching phase typically defines the similarity (distance) metric between two fingerprint representations and determines whether a given pair of representations is captured from the same finger ... based on whether a quantified (dissimilarity) is greater(less) than a certain (predetermined) threshold.").

3 INDEPENDENT CLAIM 6

3.1 The present application does not meet the criteria of Article 33(1) PCT, because the subject-matter of claim 6 is not new in the sense of Article 33(2) PCT.

Claim 6 specifies a system which is analogous to the method defined in claim 1. Therefore the argumentation given in item 2.1 above applies.

4 INDEPENDENT CLAIM 9

4.1 The present application does not meet the criteria of Article 33(1) PCT, because the subject-matter of claim 9 is not new in the sense of Article 33(2) PCT.

Claim 9 specifies a system for fingerprint *identification*. The passages cited in item 2.1 disclose all features except for the database to store control fingerprints. This however disclosed in Fig. 2 or also the first par. of section 5 "System Architecture". Therefore, all features of claim 9 are known from D₁.

5 DEPENDENT CLAIMS 2-5, 7, 8, 10-13

Dependent claims 2-5, 7, 8, 10-13 do not contain any features which, in combination with the features of any claim to which they refer, meet the requirements of the PCT in respect of novelty and/or inventive step (Article 33(2) and (3) PCT).

5.1 The additional features of claims 2,3,7,8,10,11 are regarded as trivial. It is noted that the source of the fingerprint signal (such as pressure sensor, capacitive sensor, optical sensor) *does not* influence the processing of the signal, and it is further noted that the signals or a capacitive or optical sensor can be interpreted as signals representing pressures.

Thus, to specify that the signal originates from a pressure sensor is regarded as a juxtaposition with the other unrelated features of claim 2.

**WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING
AUTHORITY (SEPARATE SHEET)**

International application No.

PCT/IB2005/050896

That fingerprint images can be grayscale resp. black and white is very well known and e.g. discloses by D₁ (Fig. 1 resp. Fig. 4).

5.2 Claim 4 does not seem to introduce additional features. The passages cited in item 2.1 are therefore considered to disclose the subject matter of claim 4. It therefore seems that the subject matter of claim 4 is not new.

5.3 Claim 5 is not clear (Article 6 PCT): it is not clear whether the distance measure depends on the number of movement steps, and further how the sorting step (72) relates to the selection step (74). The seemingly corresponding passage of the description (p.7, line 24-25) is also not clear.

This objection notwithstanding, the subject matter of claim 5 does not seem to be new as it was understood from the description that it might relate to the last par. of the left hand column of p. 832 of D₁, namely to elastic string matching.

5.4 The argumentation of item 5.2 also applies mutatis mutandis to claim 12. It hence seems that the subject matter of claim 12 is not new.

5.5 The argumentation of item 5.3 also applies to claim 13. Hence, the subject matter of claim 13 does not seem to be new.

Re Item VIII.

- 1 The terms "control point" and "control fingerprint image" used through the whole application are not standard in the field of fingerprint recognition, and in particular leave the reader in doubt about the scope of the claims (Article 6 PCT).
- 2 In claims 1, 4, 6, 9, 12 it is not clear what is meant by moving the control points during the matching process (Article 6 PCT). It can also not be doubtlessly derived from the these claims (and also not from the description) if the alleged invention relates to image based or feature point based fingerprint recognition in the sense of D₁, first par. of section "11 Fingerprint Matching".
- 3 Passages like "... is dependent upon a commercial implementation of the present invention, and is therefore without limit." are not allowable according to the PCT Guidelines, 5.30.

**This Page is Inserted by IFW Indexing and Scanning
Operations and is not part of the Official Record**

BEST AVAILABLE IMAGES

Defective images within this document are accurate representations of the original documents submitted by the applicant.

Defects in the images include but are not limited to the items checked:

- ☐ **BLACK BORDERS**
- ☐ **IMAGE CUT OFF AT TOP, BOTTOM OR SIDES**
- ☐ **FADED TEXT OR DRAWING**
- ☐ **BLURRED OR ILLEGIBLE TEXT OR DRAWING**
- ☐ **SKEWED/SLANTED IMAGES**
- ☐ **COLOR OR BLACK AND WHITE PHOTOGRAPHS**
- ☐ **GRAY SCALE DOCUMENTS**
- ☒ **LINES OR MARKS ON ORIGINAL DOCUMENT**
- ☐ **REFERENCE(S) OR EXHIBIT(S) SUBMITTED ARE POOR QUALITY**
- ☐ **OTHER:**

IMAGES ARE BEST AVAILABLE COPY.

As rescanning these documents will not correct the image problems checked, please do not report these problems to the IFW Image Problem Mailbox.